



PLANNING HAMERA AVAILS using the new MASTER ASSESSMENT INDEX



09/11/16
COMNAVSURFLANT

Continuous Maintenance ***Standard Process- MAI***

Master Assessment Index (MAI)

What systems?

Who assesses?

How to assess?

When to assess?

Maintained for each hull by SPORT



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Continuous Maintenance

Old MAI (System Level)

USS SEATTLE (AOE 3) Master Assessmer		
SWLIN	SYSTEM	EQUIPMENT
26431	PURIFIERS, LUBE OIL	PURIFIERS, LUBE OIL
31111	GENERATOR SET, SHIP SERVIC	GENERATOR SET, SSTG NO. 1
31112	GENERATOR SET, SHIP SERVIC	GENERATOR SET, SSTG NO. 2
31113	GENERATOR SET, SHIP SERVIC	GENERATOR SET, SSTG NO. 3
31114	GENERATOR SET, SHIP SERVIC	GENERATOR SET, SSTG NO. 4
31211	GENERATOR SET, EMERGENCY D	GENERATOR SET, EDG NO.1
31211	GENERATOR SET, EMERGENCY D	GENERATOR SET, EDG NO.2
31211	GENERATOR SET, EMERGENCY D	GENERATOR SET, EDG NO.1
31211	GENERATOR SET, EMERGENCY D	GENERATOR SET, EDG NO.2
31421	MOTOR GENERATORS 400 HZ	MOTOR GENERATORS 400 HZ
31421	MOTOR GENERATORS 400 HZ	MOTOR GENERATORS 400 HZ
31431	POWER CONVERSION, SPECIAL	POWER CONVERSION, SPECIAL
31431	POWER CONVERSION, SPECIAL	POWER CONVERSION, SPECIAL
32411	SWITCHGEAR AND PANELS	SWITCHGEAR AND PANELS
32411	SWITCHGEAR AND PANELS	SWITCHGEAR AND PANELS
34111	LUBE OIL SYSTEM, NO. 1 SHI	LUBE OIL SYSTEM, STTG NO.
34111	LUBE OIL SYSTEM, NO. 1 SHI	LUBE OIL SYSTEM, STTG NO.
34112	LUBE OIL SYSTEM, NO. 2 SHI	LUBE OIL SYSTEM, STTG NO.
34112	LUBE OIL SYSTEM, NO. 2 SHI	LUBE OIL SYSTEM, STTG NO.



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New MAI

- MAI, through **RPN** filters, identify the SCLSIS/CDMD-OA database for all “Maintenance-Worthy objects”
- “Maintenance-Worthy object” is a object which can be efficiently and effectively maintained using the FIND-FIX-TRAIN HM&ERA visit.



Continuous Maintenance

What is the Risk Priority Number ???

- $RPN = (\text{impact rating}) * (\text{probability of occurrence rating}) * (\text{probability of remediation rating})$
 - Impact: Effect of system or element failure on crew, mission, and / or ship's capability.
 - Occurrence : Probability that the failure will occur over the 12- month period following assessment
 - Remediation: probability that the failure can be repaired if it occurs.



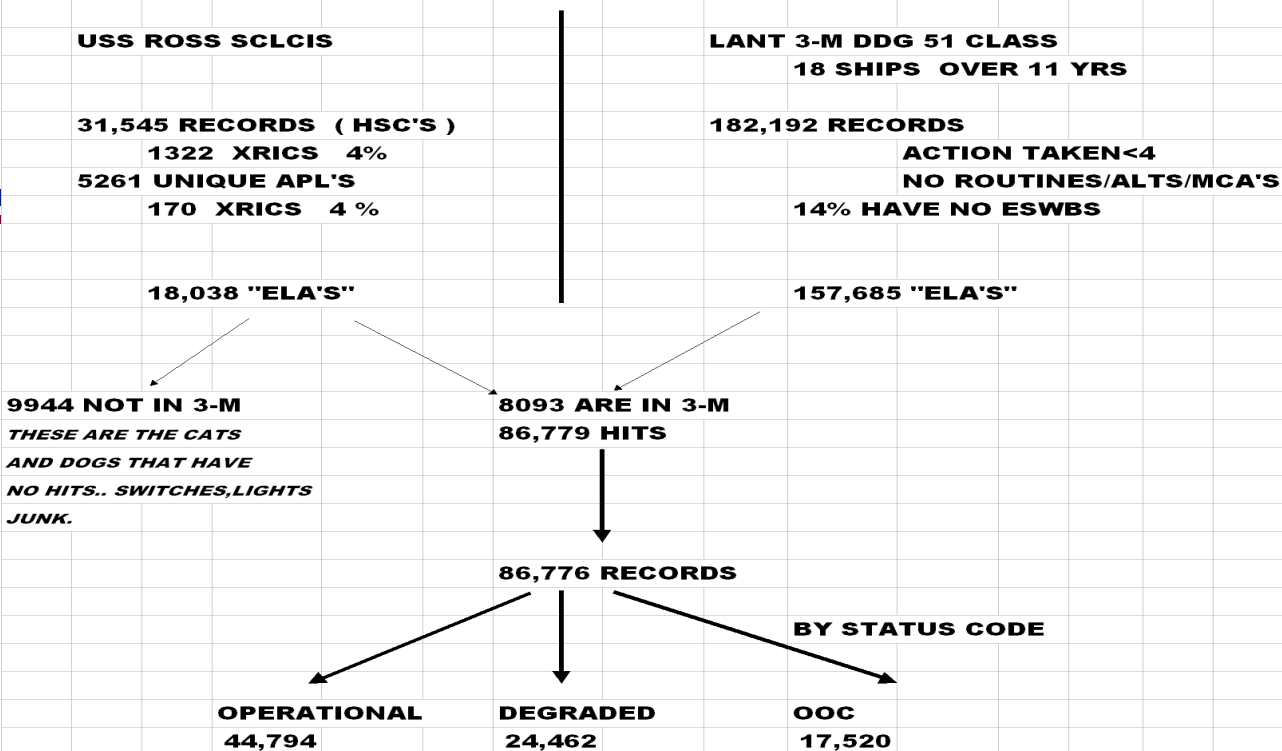
New MAI - Proof of Concept

- Can ship's 3-M data identify assessment candidates?
- USS ROSS as Test Case 7/20/2002
 - 31,545 SCLSIS Records
 - All of CNSL DDG 3-M history
 - 18 ships over 11 years 182,000 completed maintenance actions
 - Common Data Element ESWBS + Location + APL (ELA)
 - Calculated Mean Time to Maintenance
 - Calculated probability of failure in a 12 MO. Period
 - Calculated Risk Priority Number for occurrence RPN(o)
- CNSL N432 approval to implement 9/20/2002



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**PROOF OF CONCEPT : CAN ACCUMULATE SHIP'S 3-M DATA ON A CLASS OF SHIPS
IDENTIFY ASSESSMENT CANDIDATES FOR A SINGLE SHIP.**



APPLYING THE FMEA OCCURRENCE RANKING (ODU)

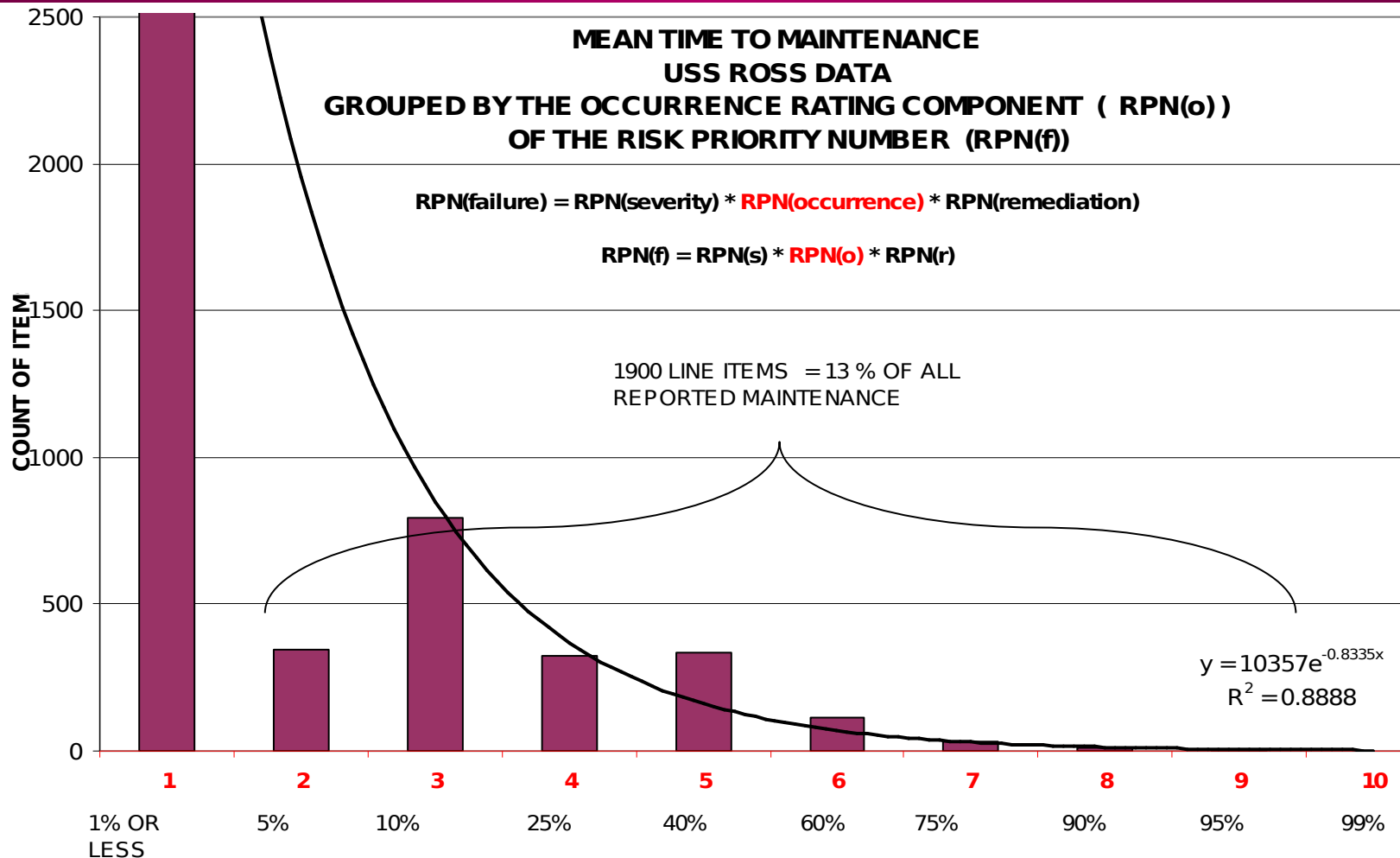
$$\text{MTT(X)} = \frac{\text{SUM OF "ELA" INSTALLED HOURS} \times \text{"ELA" POPULATION}}{\text{SUM OF "ELA" HITS}}$$

RESULTS (COUNT OF MAI LINE ITEMS)				PROBABILITY OF FAILURE IN 12 MO. P(fail)	
RPN	OPERATIONAL	DEGRADED	OOC		
10		0			99%
9		5			95%
8		9			90%
7		34			75%
6		111			60%
5		337			40%
4		325			25%
3		794			10%
2		346			5%
1		13782			1% or less
TOTAL		15743			



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RPN (o)



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RPN (o) AND % CHANCE OF OCCURANCE IN 12 MONTHS

Risk Priority Number RPN (o)

“sanity check”

Top 100 on the USS ROSS

ESWBS	LOCATION	APL	ENN	EFD	RPN(o)
31131	4-126-0-E	52090005	ENGINE ASSY GAS	ENGINE ASSY GAS TURB	9
4561D	03-142-0-C	ME403292	AMPLIFIER NO 1,	"AMPLIFIER NO 1	9
53621	4-126-0-E	ME403299	AN/SPY-1D & FCS	AN/SPY-1D & FCS MK 99 WATER CO	9
71121	03-109-0-WEA	6090237	RADAR WEAPON SYS	RADAR WEAPON SYSTEM	9
23411	4-174-0-E	52050023	PROPULSION GAS T	GAS GENERATOR 1A	8
31132	4-254-0-E	52090005	ENGINE ASSY GAS	ENGINE ASSY GAS TURB	8
31133	3-370-0-E	52090005	ENGINE ASSY GAS	ENGINE ASSY GAS TURB	8
45167	03-142-0-C	29079	RADAR SET	RADAR SET	8
51421	4-126-0-E	325010478	AIR CONDITIONING	AIR CONDITIONING PLANT NO 1	8
55151	4-174-0-E	61050055	HP AIR COMPRESSO	"COMPRESSOR NO 1	8
55153	4-254-0-E	69990087	COMPRESSOR NO 2,	LP AIR COMPRESSOR NO 3	8
65111	1-238-1-Q	430070170	DISHWASHER	DISHWASHER	8
86480	NOT APPLIC	XSERVICEIT	MISCELLANEOUS	MISCELLANEOUS	8
23411	4-174-0-E	59970007	BASE ENCLOSURE	BASE ENCLOSURE	7
23412	4-174-0-E	52050023	PROPULSION GAS T	GAS GENERATOR 1B	7
23413	4-254-0-E	52050023	PROPULSION GAS T	GAS GENERATOR 2A	7
23414	4-254-0-E	52050023	PROPULSION GAS T	GAS GENERATOR 2B	7
26111	4-174-0-E	480300080	FUEL SERVICE FIL	"FILTER SEPARATOR NO 1A	7
26112	4-254-0-E	480300080	FUEL SERVICE FIL	"FILTER SEPARATOR ASSY NO 2A	7
26431	4-174-0-E	760200241	PURIFIER NO 1, L	"PURIFIER NO 1	7
42411	2-50-2-C	20710	SONAR RECEIVER T	SONAR RECEIVER TRANSMITTER	7
4561D	03-142-0-C	ME403291	AMPLIFIER NO 3,	"AMPLIFIER NO 1	7
4561D	03-142-0-C	ME403294	AMPLIFIER-MONITO	AMPLIFIER-MONITOR	7
48299	01-274-1-C	ME403311	TRANSMITTER NO 3	"TRANSMITTER NO 2	7
48299	03-128-0-C	ME403311	TRANSMITTER, RAD	"TRANSMITTER NO 1	7
51422	4-220-0-E	325010480	AIR CONDITIONING	AIR CONDITIONING PLANT NO 2	7
51423	4-220-0-E	325010479	AIR CONDITIONING	AIR CONDITIONING PLANT NO 3	7
51424	5-300-01-E	325010478	AIR CONDITIONING	AIR CONDITIONING PLANT NO 4	7
53151	4-174-0-E	88880031	REVERSE OSMOSIS	REVERSE OSMOSIS PLANT NO 1A	7
55151	4-254-0-E	61050055	HP AIR COMPRESSO	"COMPRESSOR NO 2	7



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New MAI (Component Level)

DDG Class MAI Results for Cathodic Protection

UIC	VISIT	HSC	EFD	LOCATION	RIC	RESPON	RPN
21685	HMERA II	633211	MAGNETIC CONTROLLER	4-94-0-C	316060054	FTSC	5
21685	HMERA II	633212	POWER SUPPLY	3-319-0-Q	111590030	FTSC	1
21685	HMERA II	633213	POWER SUPPLY	4-126-0-E	111590023	FTSC	2
21685	HMERA II	633218	MAGNETIC CONTROLLER	3-300-0-C	316060054	FTSC	4
21685	HMERA II	633219	GROUNDING ASSEMBLY, PORT SHAFT	5-300-01-E	316060032	FTSC	4
21685	HMERA II	63321A	GROUNDING ASSEMBLY, STARBOARD	5-300-01-E	316060032	FTSC	4
21685	HMERA II	63321D	ANODE ASSEMBLY	4-442-0-E	316060085	FTSC	0
21685	HMERA II	63321E	CATHODIC PROTECTION SYSTEM ANODE	4-174-0-E	316060085	FTSC	1
21685	HMERA II	63321F1	REFERENCE ELECTRODE	4-174-0-E	316060034	FTSC	1
21685	HMERA II	63321F2	REFERENCE ELECTRODE	4-174-0-E	316060061	FTSC	1
21685	HMERA II	63321F3	REFERENCE ELECTRODE	4-174-0-E	316060061	FTSC	1
21685	HMERA II	63321F4	REFERENCE ELECTRODE	4-442-0-E	316060061	FTSC	1
21685	HMERA II	63321G	CATHODIC PROTECTION SYSTEM ANODE	4-254-0-E	316060084	FTSC	1
21685	HMERA II	63321H	CATHODIC PROTECTION SYSTEM ANODE	4-254-0-E	316060083	FTSC	0

Cathodic Protection would be assessed

09/01/16 based on the results of MAI

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Ammo Hoist**Bleed Air System****CHT/Graywater****Conveyor****Dry Air System****Electronic Cooling Water****Hull Watertight Closures****Main Gas Turbines****OWS Separator/Transfer Pumps****Remote Operating Gear****Sea Valves****Sonar Dome Press Sys****Steering System**

- ☐ 400 Hz SFCs
- ☐ Air Conditioning
- ☐ Anchor Windlass
- ☐ Backflow Preventers
- ☐ Boat Davits
- ☐ Capstans
- ☐ Chill Water Pumps

☐ Consoles/MCS☐ CPS☐ CRP☐ Deckhouse Watertight Closures☐ Degaussing☐ Distilling Plant☐ DMS☐ Fuel Oil Pumps☐ Fuel Oil Purifier☐ Galley Equipment☐ Gas Turbine Generators☐ GTG/GTM Cooling Fans☐ GTG Sea Water Cooling Pumps☐ High Pressure Air Compressor☐ High Pressure Dehydrators☐ HP Air Drop Test/Groom☐ Hull Decks (incl Bot. & Tank Tops)☐ Hull, Structural Bulkheads less S/Struct☐ Hull, Structure Above Underwater Body☐ ICAS (If equipped)☐ Intakes/Uptakes☐ JP-5 Priming/Service/Transfer Pumps☐ Laundry Equipment☐ Line Shaft Bearings☐ Low Pressure Air Compressor☐ LPAD Type I/II Dehydrators☐ Lube Oil Purifier☐ Main Lube Oil Pumps☐ Mast☐ Motor Controllers☐ Refrigeration☐ Sea Water Service Pumps☐ Sliding Padeyes☐ Stern Tube Seals☐ Superstructure☐ UPS☐ Toxic Vent Fans & Dampers (w/4200)☐ TROD/Expert System☐ Ventilation

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Approved by: _____
Signature _____ Date _____
Commanding Officer, USS Sample (DDG 51)

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New MAI Pre-Brief list

USS GONZALEZ

SYSTEM NOMENCLATURE	LINE ITEMS ON BOARD	LINE ITEMS ON AGENDA		
400 HZ POWER	62	51	82%	
AIR CONDITIONING	386	94	24%	
ALARMS AND WARNING SYSTEMS	1170	53	5%	
AMMO ELEVATORS	28	11	39%	
ANCHOR WINDLASS	23	4	17%	
ANNOUNCING SYSTEM	17		0%	
AUXILIARY CIRC PUMPS	6	3	50%	
BOAT DAVIT	20	8	40%	
CATHODIC PROTECTION	15	4	27%	
CHT	122	30	25%	
CONSOLES	2	1	50%	
CONTROLLABLE PITCH PROPELLERS	94	94	100%	
DEGAUSSING	12	4	33%	
DIGITAL MULTIPLEXING SYSTEM	408	40	10%	
DISTILLING PLANTS	69	14	20%	
DOORS	218	218	100%	
DRAINAGE AND BALLAST SYSTEM	10	2	20%	
DRY AIR SYSTEM	26	19	73%	
ELECTRONIC COOLING WATER	28	28	100%	
FIRE PUMPS	24	10	42%	
FIREMAIN AND FLUSHING	45	7	16%	
FUEL OIL PUMPS	34	7	21%	
FUEL OIL SERVICE PUMPS	28	12	43%	



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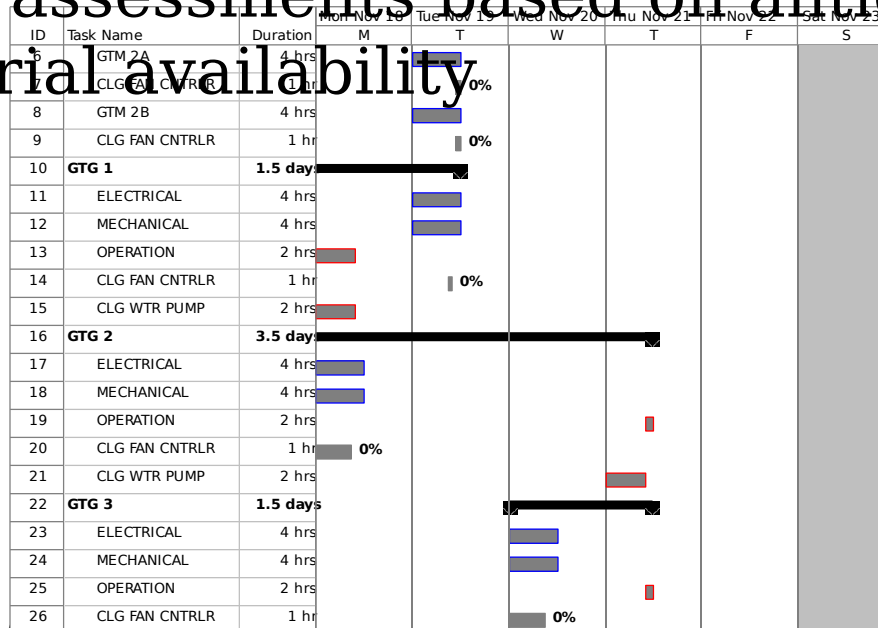
Standard Process- The New MAI

- Fully automated , Spear web application
 - **Live links to ships configuration (CDMD-OA) and ships 3-m (NSLC)**
 - **Use a Risk Priority Number (RPN) to determine what systems to assess.**
 - **Push items based on CSMP**
- Maintain and produce all visit elements required to Plan and Execute a HMER A availability in an ERP environment.
 - **ICMP.. all applicable Q tasks**
 - Work Orders, Job Plans, (e-MRC) , Standard Statements, Bill of Materials, etc.
 - For validation,assessment and fix.



Continuous Maintenance *HM&ERA - Building an Assessment Plan*

- PM manages visit to de-conflict support system requirements
- Assist in identifying labor requirements
- Prioritize assessments based on anticipated repairs and material availability



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Continuous Maintenance Standard Process- Work order and Job plan

07/09/2003

JOB CONTROL NUMBER		WCID: Jun 26 2003 04:15PM	
UIC: 21680	OCC: CE04	JSN:	
SHIP NAME:	USS BARRY	DDG52	
APL/AEL:		312090222	
EQUIPMENT NOUN NAME:		DOOR, STRUCTURAL, 06-161-2	
SERIAL ID:			
EIC:		AD01000	
LOCATION:		06-160-0-MST	
CONFIGURATION CHANGE:			
WORK REQ ROUTINE NO:	A	A21679	
FOR INSURV BOARD USE:	NUMBER:	SUFFIX:	MISSION:
			SAFETY:0 R & M:
DEFERRAL ACTION:	0	COMPLETED ACTION:	
DEFERRAL DATE:	06/26/2003	SHIPS FORCE M/H:	1
S/F M/H REMAINING:	0.5	COMPLETION DATE:	
DEADLINE DATE:	08/01/2003	ACTIVE MAINT TIME:	
DEFERRAL REASON:	0	TROUBLE ISOLATION:	
WND:8 STA:0 CAS:0	When to be Accomplished: IMMEDIATELY		ACTION TAKEN:
WORK CANDIDATE SUMMARY: 06-162-2 WT CLOSURES ASSESSMENT			
CONTACTS:		SITE SCREENING:	3
1ST CONTACT:	CE04	UIC SCREENING:	
2ND CONTACT:	CE04	TYCOM SCREENING:	
FINAL SCREENER:		PRIORITY:	4
REFERRED FROM:			
REFERRED TO:			
PRESENT:			
ASSIGNED TO:			

JOB PLAN:

HSC: 16812171
 RIN: 1017B 1017B
 RIC: 312090222 312090222
 SYSTEM: DK HSE CLOSURES DK HSE CLOSURES
 EFD: DOOR, STRUCTURAL, 06-161-2
 LOCATION: 06-160-0-MST 06-160-0-MST
 EQ SERIAL:
 PRID: 06-162-2 06-162-2
 QTY: 1 1
 WCRE: CE04 CE04
 EIC: AD01000 AD01000
 CAGE:
 ISEA:
 RIC NOM: DOOR,MARINE,WATERTIGHT,IND DOGGED,RH
 PERFORM TRAINING
 Conduct Assessment Procedure for the Doors
 (1) Paint, dust or other foreign matter on gaskets
 (2) Distortion and deterioration of metal surface
 (3) Obstructions in way of access to closure.
 (4) Loose or missing jamnuts, self-locking nuts
 (5) Loose/missing/sheared setscrews for flanges
 (6) Missing/damaged packing plunger in dog spindle
 (7) Dog Handle missing/broken/worn spring clips
 (8) Cotter pins missing from round nuts on studs
 (9) Cracks/deterioration/open joints/excessive set
 (10) Missing hinge adj screws and/or lock nuts
 (11) Missing washers/nuts in connecting link studs
 (12) Cracked or broken welds on hinge pads, hinge
 (13) With door open, operate linkage and assess
 (14) Missing dogging wrench pipes.
 (15) Missing/damaged dog wrench stowage bracket
 (16) Proper operation/condition of safety latch
 (17) Locking arm adrift or inoperative.



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Standard Process- Assessment / verification tracking in ships 3-m

		csmpt_narrative_summary opening	csmpt_narrative_summary closing
no ck	no work	ASSMT REQD FTSC 4326 6XHW	ASSMT/VER COMP-CK NO ,RPRS NO
ck reqd	no work	ASSMT REQD FTSC 4326 6XHW	ASSMT/VER COMP-CK YES,RPRS NO
no ck	work reqd	ASSMT REQD FTSC 4326 6XHW	ASSMT/VER COMP-CK NO ,RPRS YES
ck reqd	work reqd	ASSMT REQD FTSC 4326 6XHW	ASSMT/VER COMP-CK YES,RPRS YES
AUTO GENERATED BLOCK 35'S FOR VERIFICATION / ASSESSMENT			
		ASSESSMENT AND VERIFICATION COMPLETED XXX NO CONFIGURATION CHANGES REQUIRED NO REPAIRS REQUIRED . ASSESSED BY M. SINKS, POC J. BRUCKNER, SPORT CODE 221.2, DSN 961-4001, COMM (757)396-4001. *{ASSESS/HMERA I//NORFOLK /D/UNSAT/S // /0.9/ / / /"}TECH/M. SINKS /SPORT 221.2 /{(757)396-4001}"	
		ASSESSMENT AND VERIFICATION COMPLETED XXX CONFIGURATION CHANGES SUBMITTED FOR THE FOLLOWING APL-1122212JJ . NO REPAIRS REQUIRED . ASSESSED BY M. SINKS, POC J. BRUCKNER, SPORT CODE 221.2, DSN 961-4001, COMM (757)396-4001. *{ASSESS/HMERA I//NORFOLK /D/UNSAT/S // /0.9/ / / /"}TECH/M. SINKS /SPORT 221.2 /{(757)396-4001}"	
		ASSESSMENT AND VERIFICATION COMPLETED XXX NO CONFIGURATION CHANGES REQUIRED REPAIR REQUIREMENTS SUBMITTED ON EM01-A100. ASSESSED BY M. SINKS, POC J. BRUCKNER, SPORT CODE 221.2, DSN 961-4001, COMM (757)396-4001. *{ASSESS/HMERA I//NORFOLK /D/UNSAT/S // /0.9/ / / /"}TECH/M. SINKS /SPORT 221.2 /{(757)396-4001}"	
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Continuous Maintenance *Standard Process- Standard Statements*

Components with SSs and their SSs by System

SystemDescription: DOORS

Component DOOR

SS ID Standard Statement

ReviewStatus

CSMP Summary

40547	ADJ USTING SCREWS MISSING. XXX REPLACE ADJ USTING SCREWS.	T
40548	ADJ USTING SCREWS WORN. XXX REPLACE ADJ USTING SCREWS.	T
40549	CONNECTING ROD BUSHING MISSING. XXX REPLACE CONNECTING ROD	T
40550	CONNECTING ROD BUSHING WORN. XXX REPLACE CONNECTING ROD	T
40551	CONNECTING ROD NUT MISSING. XXX REPLACE CONNECTING ROD NUT.	T
40552	CONNECTING ROD NUT WORN. XXX REPLACE CONNECTING ROD NUT.	T
40553	CONNECTING ROD STUD MISSING. XXX REPLACE CONNECTING ROD STUD.	T
40554	CONNECTING ROD STUD WORN. XXX REPLACE CONNECTING ROD STUD.	T
40555	CONNECTING ROD WASHER MISSING. XXX REPLACE CONNECTING ROD	T
40556	CONNECTING ROD WASHER WORN. XXX REPLACE CONNECTING ROD	T
40557	COTTER PINS MISSING. XXX REPLACE COTTER PINS.	T
40558	COTTER PINS WORN. XXX REPLACE COTTER PINS.	T
40560	DOG BUSHING SEIZED. XXX DISSASSEMBLE, CLEAN AND LUBRICATE DOG BUSHING.	T
40562	DOG BUSHING STIFF. XXX DISSASSEMBLE, CLEAN AND LUBRICATE DOG	T
40561	DOG BUSHING WORN. XXX REPLACE DOG BUSHING.	T
40563	DOG SELF-LOCKING NUT MISSING. XXX REPLACE DOG SELF-LOCKING NUT.	T
40564	DOG SELF-LOCKING NUT WORN. XXX REPLACE DOG SELF-LOCKING NUT.	T
40565	DOG WEDGES MISSING. XXX REPLACE DOG WEDGES.	T

Wednesday, July 09, 2003



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Standard Process- The New MAI in Production

- **HMER A AVAILS
SUPPORTED TO DATE**

- USS ROOSEVELT
- USS McFAUL
- USS MAHAN
- USS GONZALAS
- USS CARNEY
- USS LABOON
- USS COLE
- USS BARRY
- USS MAHAN
- USS LABOON
- USS RAMAGE
- USS DONALD COOK
- USS BULKELEY
- USS MONTEREY
- USS LEYTE GULF
- USS VELLA GULF

- **HMER A AVAILS THRU FY 03**

- USS BARRY
- USS HALYBURTON
- USS IWO JIMA
- USS MITSCHER
- USS SENTRY
- USS DEVASTATOR
- USS McINERNEY
- USS SAIPAN (MAINT TEAM)
- USS OSCAR AUSTIN
- USS JOHN L HALL
- USS PELICAN
- USS PONCE
- USS SENTRY
- USS ASHLAND



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